

Reusing Turfgrass Clippings to Improve Turfgrass Health and Performance in Central and Northern California



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REUSING TURFGRASS CLIPPINGS TO IMPROVE TURFGRASS HEALTH AND PERFORMANCE IN CENTRAL AND NORTHERN CALIFORNIA

Introduction

The California Integrated Waste Management Act of 1989 (AB 939, Sher, Chapter 1095, Statutes of 1989), mandates a 50 percent diversion of landfill wastes that each county and city generates, based on 1990 levels. Grasscycling, composting, and mulching offer valuable alternatives to depositing grass clippings in landfills, and promote the growth of healthy landscape plants. Studies indicate that an average California lawn generates 300 to 400 pounds of grass clippings per 1,000 square feet annually, which equates to as much as eight tons per acre each year. Grass clippings historically have comprised half of the yard trimmings deposited in California landfills, and yard trimmings make up the largest single component of California's municipal waste.

Grasscycling

In grasscycling, clippings are simply left on the turf area as it is mowed to decompose, rather than bagged. Grasscycling is an excellent method of recycling a valuable organic resource in lawns and large public and commercial turfgrass plantings such as parks, cemeteries, school grounds, and portions of golf courses. In situations where prolonged wet weather, mechanical breakdown of mowers, or infrequent mowing result in large amounts of clippings, the cut turfgrass should be bagged and composted or dried for use as mulch. Besides diverting organic matter from landfills, grasscycling supplies valuable organic material and nutrients to the soil. Grass clippings decompose quickly. They typically contain about 4 percent nitrogen, 0.5 percent phosphorus, and 2 percent potassium, which reduce fertilizer requirements by approximately 20 percent. Grasscycling also reduces mowing time and disposal costs.

Golf course putting greens, sod farms, and major league sports fields are not as adapted to grasscycling due to their requirements for exceptionally uniform playing surfaces.

TABLE 1. Recommended Turfgrass Mowing Heights

Turfgrass Type	Mower Setting (Inches)	Mow When Grass Reaches This Height (Inches)
Bermudagrass (common)	1 to 1-1/2	1-1/2 to 2-1/4
Bermudagrass (hybrid)	1/2 to 1 inch	3/4 to 1-1/2
Buffalograss	1 to 2	1-1/2 to 3
Kentucky bluegrass	1-1/2 to 2-1/2	2-1/4 to 3-3/4
Kikuyugrass	1 to 1-1/2	1-1/2 to 2-1/4
Perennial ryegrass	1-1/2 to 2-1/2	2-1/4 to 3-3/4
St. Augustinegrass	1 to 2	1-1/2 to 3
Tall Fescue	1-1/2 to 3	2-1/4 to 4-1/2
Zoysiagrass	1/2 to 1-1/2	3/4 to 2-1/4

Table 2 indicates how many minutes to irrigate warm- and cool-season turfgrasses each week, based on the precipitation rate of the irrigation system. If runoff or brown spots occur with one weekly irrigation, the weekly total should be divided by two, three, or four, to water two, three, or four times a week for fewer minutes. Irrigating until runoff just begins is the preferred length of an individual irrigation. In cases where soil has a slow infiltration rate or the irrigation precipitation rate is high, irrigation cycling is necessary. To accomplish cycling effectively, irrigate until runoff just begins, turn the system off, and repeat the process in ten or fifteen minutes before the soil surface dries out. Repeat if necessary.

To determine the precipitation rate, conduct "can tests" by setting out small, empty, straight-sided containers every ten to fifteen feet between sprinkler heads operated by the same valve, and run the system for 15 minutes. There are a wide array of cans that work well for this purpose, including clean, empty tuna and catfood cans. (If cups or other non-straight-sided cans are used, volumetric measurements need to be taken, which increases the amount of time required for this task.)

Measure the amount of water in each can with a ruler, and determine the average amount of water per can. Multiply this average by four to determine the precipitation rate per hour. Conducting can tests regularly is useful for determining how evenly irrigation water is distributed over the area (distribution uniformity), so that sprinkler head misalignments and other mechanical problems can be corrected.

The best time to irrigate is early in the morning, because less water is lost to evaporation and water pressure is at its peak. Irrigating in the afternoon is wasteful due to high evaporation rates, and prolonged damp conditions in the evening may encourage disease development.

Composting

Turfgrass clippings are an excellent addition to a compost pile. Since grass clippings contain higher levels of nitrogen than other organic landscape materials, they help balance the carbon to nitrogen (C:N) ratio. While tree leaves alone will decompose, leaves mixed with turfgrass clippings decompose faster and more completely. Because turfgrass clippings are small and herbaceous, they will decompose readily and can be added "as is" to a compost pile without further chopping or cutting. Grass clippings should not be composted alone; unfavorable conditions resulting from low levels of oxygen will develop. Large amounts of wet clippings should be dried before they are added to a compost pile.

There are numerous physical benefits derived from amending planting beds for annuals and perennials with compost, as long as the material is well decomposed and is mixed evenly and deeply into the soil. Established turf sites may benefit from a shallow (not more than 1/2 inch) layer of compost topdressing, applied four times a year. In addition to nutritional benefits, a light compost topdressing can improve soil microbial activity, aiding in soil aeration and overall health of the turfgrass planting.

Mulching

Dried turfgrass clippings applied as a mulch aid in weed control and prevent moisture loss in ornamental planting beds. While a three- to four-inch layer of mulch is necessary to reduce weed infestations, adding too much mulch prevents oxygen movement into the soil. Mulches used around tree trunks should not come in contact with the trunk. Mulching with bermudagrass clippings should be avoided due to its invasiveness, as should mulching with clippings receiving recent or regular herbicide applications. If questions exist pertaining to any chemicals that may have been applied, turfgrass clippings should be thoroughly leached before being dried and used as mulch.



NORTHEASTERN MOUNTAIN VALLEYS

Warm-Season Turfgrasses

Cool-Season Turfgrasses

Minutes to irrigate/week if hourly sprinkler output is:

		0.5 in	1.0 in	1.5 in	2.0 in
NOT RECOMMENDED	JAN	17	08	06	04
	FEB	34	17	11	08
	MAR	59	29	20	15
	APR	101	50	34	25
	MAY	134	67	45	34
	JUN	168	84	56	42
	JUL	210	105	70	53
	AUG	176	88	59	44
	SEP	126	63	42	32
	OCT	76	38	25	19
	NOV	25	13	09	06
	DEC	17	09	06	04

NORTHERN COAST

Warm-Season Turfgrasses

Cool-Season Turfgrasses

Minutes to irrigate/week if hourly sprinkler output is:

		0.5 in	1.0 in	1.5 in	2.0 in
NOT RECOMMENDED	JAN	15	07	05	04
	FEB	36	18	12	09
	MAR	55	27	18	14
	APR	67	34	22	17
	MAY	88	44	29	22
	JUN	97	48	32	24
	JUL	95	47	32	24
	AUG	90	45	30	23
	SEP	76	38	25	19
	OCT	48	24	16	12
	NOV	32	16	11	08
	DEC	21	11	07	05

NORTHERN INLAND VALLEYS

Warm-Season Turfgrasses

Cool-Season Turfgrasses

Minutes to irrigate/week if hourly sprinkler output is:

Minutes to irrigate/week if hourly sprinkler output is:

	0.5 in	1.0 in	1.5 in	2.0 in		0.5 in	1.0 in	1.5 in	2.0 in
JAN	19	09	06	05	JAN	25	13	08	06
FEB	32	16	11	08	FEB	42	21	14	11
MAR	50	25	17	13	MAR	67	34	22	17
APR	69	35	23	17	APR	92	46	31	23
MAY	101	50	34	25	MAY	134	67	45	34
JUN	126	63	42	32	JUN	168	84	56	42
JUL	132	66	44	33	JUL	176	88	59	44
AUG	120	60	40	30	AUG	160	80	53	40
SEP	95	47	32	24	SEP	126	63	42	32
OCT	57	28	19	14	OCT	76	38	25	19
NOV	25	13	08	06	NOV	34	17	11	08
DEC	13	06	04	03	DEC	17	08	06	04

Mowing

When grasscycling, it is usually necessary to mow at least weekly during the active growing season to avoid a build-up of excess clippings. Turfgrass that is not cut frequently enough when grasscycling may produce a "hay-like" look which can be unsightly. Maintaining turfgrass at the recommended mowing height is also important. Follow the "1/3 rule"; mow often enough so that no more than 1/3 of the length of the grass blade needs to be removed during any single mowing. This allows short clippings to work their way through the canopy to decompose, without covering the surface.

It is important to use sharp mower blades and mow when the surface is dry. **Table 1** indicates recommended mowing heights for several species of turfgrass. Studies have shown that there are benefits to maintaining a relatively high mowing height to encourage the development of deeper roots, which can improve drought resistance and reduces stress.

Mower Options

Many types of mowers adapt to grasscycling. Mowers with a safety flap covering the opening where the bag fits into the chute offer the option of simply removing the bag. Mowers without a flap, or a plug for the chute, may be adapted to retrofitting. Contact a reputable dealer to inquire about the availability of purchasing a retrofit kit.

Major lawnmower manufacturers offer mulching or recycling mowers which cut grass blades into small pieces before reapplying them to the turfgrass. Horsepower rating is very important when shopping for a mulching mower; a model supplying at least 4 or 5 horsepower is recommended. Convertible mulching mowers should have blades that can conveniently be changed. Otherwise, they may end up being used for only one purpose, defeating their intended dual use! Studies indicate that seasonal mowing time can be reduced by 50 percent or more when mulching or recycling mowers are used compared to conventional bagging and disposal operations. Additionally, the potential for back strains and injuries is reduced, which can result in significant savings on health care costs and workers compensation.

In some cases, grasscycling is not appropriate. Examples are instances when the grass is too wet or when it has not been regularly mowed and is too tall. Options such as composting and mulching are viable alternatives to grasscycling in these cases.

Thatch

Thatch is comprised of lignin-containing roots, stems, rhizomes, crowns, and stolons, and decomposes relatively slowly. Since turfgrass clippings are approximately 80 percent water and contain only small amounts of lignin, they decompose rapidly. Research conducted in California indicates that grasscycling only slightly increases the amount of thatch buildup, and the benefits outweigh the disadvantages in most situations. Bermudagrass, Kentucky bluegrass and kikuyugrass produce more thatch than most other turfgrasses, and require regular dethatching whether the site is grasscycled or not. A 1/2-inch layer of thatch provides insulation to roots, reduces soil water evaporation, cushions playing surfaces, and may prevent soil compaction.

Fertilization

Proper fertilization is important to insure healthy, safe turfgrass sites. Over-fertilization should be avoided to prevent excessive shoot growth and weak turfgrass, and the need for frequent mowing. For moderate, even growth, a combination of fast-acting fertilizers (ammonium nitrate, ammonium sulfate, or urea) and slow-release nitrogen sources (sulfur-coated urea, urea formaldehyde, IBDU, and organic materials) should be used. While turfgrasses differ in their fertilizer requirements, it is usually better for the grass and the environment to apply smaller quantities of fertilizer more frequently, concentrating on the active growing season, rather than applying larger amounts less often. Grasscycling supplies about 20 percent of the fertilizer requirements of most turfgrasses.

Irrigation

Proper irrigation is always a high priority when maintaining turfgrass plantings, but is particularly important when grasscycling. Applying too much water is wasteful and can increase growth, requiring more frequent mowing. Not applying enough water may lead to unhealthy, slow-growing grass vulnerable to disease and insect pests. In general, deep irrigation leads to deep root systems, which increases drought resistance and reduces stress. Turfgrasses vary in their need for water. Warm-season turfgrasses (bermudagrass, zoysiagrass, buffalograss, kikuyugrass and St. Augustinegrass) are more drought resistant than cool-season turfgrasses (tall fescue, bluegrass, annual and perennial ryegrass) and require about 20 percent less water.

TABLE 2. Minutes to Irrigate Warm- and Cool-Season Turfgrass per Week in Central and Northern California

CENTRAL COAST

Warm-Season Turfgrasses					Cool-Season Turfgrasses				
Minutes to irrigate/week if hourly sprinkler output is:					Minutes to irrigate/week if hourly sprinkler output is:				
	0.5 in	1.0 in	1.5 in	2.0 in		0.5 in	1.0 in	1.5 in	2.0 in
JAN	38	19	13	09	JAN	50	25	17	13
FEB	50	25	17	13	FEB	67	34	22	17
MAR	63	32	21	16	MAR	84	42	28	21
APR	88	44	29	22	APR	118	59	39	29
MAY	101	50	34	25	MAY	134	67	45	34
JUN	113	57	38	28	JUN	151	76	50	38
JUL	95	47	32	24	JUL	126	63	42	32
AUG	113	57	38	28	AUG	151	76	50	38
SEP	95	47	32	24	SEP	126	63	42	32
OCT	69	35	23	17	OCT	92	46	31	23
NOV	50	25	17	13	NOV	67	34	22	17
DEC	38	19	13	09	DEC	50	25	17	13

CENTRAL INLAND VALLEYS

Warm-Season Turfgrasses					Cool-Season Turfgrasses				
Minutes to irrigate/week if hourly sprinkler output is:					Minutes to irrigate/week if hourly sprinkler output is:				
	0.5 in	1.0 in	1.5 in	2.0 in		0.5 in	1.0 in	1.5 in	2.0 in
JAN	32	16	11	08	JAN	42	21	14	11
FEB	44	22	15	11	FEB	59	29	20	15
MAR	69	35	23	17	MAR	92	46	31	23
APR	95	47	32	24	APR	126	63	42	32
MAY	113	57	38	28	MAY	151	76	50	38
JUN	113	57	38	28	JUN	151	76	50	38
JUL	132	66	44	33	JUL	176	88	59	44
AUG	126	63	42	32	AUG	168	84	56	42
SEP	107	54	36	27	SEP	143	71	48	36
OCT	76	38	25	19	OCT	101	50	34	25
NOV	44	22	15	11	NOV	59	29	20	15
DEC	32	16	11	08	DEC	42	21	14	11

SIERRA

Warm-Season Turfgrasses					Cool-Season Turfgrasses				
					Minutes to irrigate/week if hourly sprinkler output is:				
						0.5 in	1.0 in	1.5 in	2.0 in
NOT RECOMMENDED					JAN	31	15	10	08
					FEB	43	22	14	11
					MAR	79	39	26	20
					APR	124	62	41	31
					MAY	164	82	55	41
					JUN	207	103	69	52
					JUL	231	115	77	58
					AUG	198	99	66	50
					SEP	141	70	47	35
					OCT	96	48	32	24
					NOV	40	20	13	10
					DEC	20	10	07	05

SACRAMENTO VALLEY

Warm-Season Turfgrasses

Minutes to irrigate/week if hourly sprinkler output is:

	0.5 in	1.0 in	1.5 in	2.0 in
JAN	19	09	06	05
FEB	44	22	15	11
MAR	69	35	23	17
APR	101	50	34	25
MAY	126	63	42	32
JUN	158	79	53	39
JUL	164	82	55	41
AUG	145	72	48	36
SEP	113	57	38	28
OCT	82	41	27	20
NOV	38	19	13	09
DEC	19	09	06	05

Cool-Season Turfgrasses

Minutes to irrigate/week if hourly sprinkler output is:

	0.5 in	1.0 in	1.5 in	2.0 in
JAN	25	13	08	06
FEB	59	29	20	15
MAR	92	46	31	23
APR	134	67	45	34
MAY	168	84	56	42
JUN	210	105	70	53
JUL	218	109	73	55
AUG	193	97	64	48
SEP	151	76	50	38
OCT	109	55	36	27
NOV	50	25	17	13
DEC	25	13	08	06

SAN JOAQUIN VALLEY

Warm-Season Turfgrasses

Minutes to irrigate/week if hourly sprinkler output is:

	0.5 in	1.0 in	1.5 in	2.0 in
JAN	19	09	06	05
FEB	38	19	13	09
MAR	69	35	23	17
APR	101	50	34	25
MAY	132	66	44	33
JUN	164	82	55	41
JUL	170	85	57	43
AUG	145	72	48	36
SEP	113	57	38	28
OCT	69	35	23	17
NOV	32	16	11	08
DEC	13	06	04	03

Cool-Season Turfgrasses

Minutes to irrigate/week if hourly sprinkler output is:

	0.5 in	1.0 in	1.5 in	2.0 in
JAN	25	13	08	06
FEB	50	25	17	13
MAR	92	46	31	23
APR	134	67	45	34
MAY	176	88	59	44
JUN	218	109	73	55
JUL	227	113	76	57
AUG	193	97	64	48
SEP	151	76	50	38
OCT	92	46	31	23
NOV	42	21	14	11
DEC	17	08	06	04



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Additional Resources

The California Integrated Waste Management Board's "Commercial Landscaping" Web site (www.ciwmb.ca.gov/Organics/Landscaping/) contains helpful information and a listing of publications for online ordering or downloading on using landscape management practices that reduce waste generation, reuse trimmings on site, and recycle organic products (mulch and compost) back into urban landscapes while also saving time and money.

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